



Case Report on Subarachnoid Hemorrhage

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Introduction: Subarachnoid haemorrhage (SAH) is caused by intracranial bleeding into the cerebrospinal fluid-filled space between the arachnoid and pia mater membranes on the surface of the brain.

Patient History: The 65-year-old female patient was hospitalised to AVBR hospital in neurosurgery ward on December 25, 2020 with the chief complaints of headache, vomiting and episodes of seizures since three days. The patients had episodes of seizures on 21/12/2020 and 24/12/2020. The day later she was admitted to the Intensive Care Unit. she underwent all routine investigations like blood tests, and CT scan. After a thorough examination, the final diagnosis was subarachnoid haemorrhage.

Past History: Patient did not have any history of communicable disease, asthma, tuberculosis, or any hereditary disease. Patient was COVID – negative and did not have any significant surgical history.

Pharmacology: Patient was treated with proton pump inhibitor, antiemetic, antiepileptic, calcium channel blocker, stool softener analgesic and antipyretic.

Management: Inj. Levipril 500 mg, Inj.pan40-40mg, cap.nimodipine 60mg every four hourly, Inj.emset 4 mg, Inj. Neomol 100 ml, Syp. glycerol 30 ml, Syp. Zincovit 2tsp and Tablet Dolo 650mg.

Nursing Management: Patient's vital sign (including blood pressure) and neurological status were monitored with bed rest, pain management and assessment of risk of bleeding.

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Conclusion: Patient was hospitalised with a threeday history of headache, vomiting, and episodes of seizures actively managed; condition satisfactory.

Keywords: Subarachnoid haemorrhage; cerebral aneurysm; medical management; pharmacology.

1. INTRODUCTION

Subarachnoid haemorrhage is caused by intracranial bleeding into the cerebrospinal fluid-filled area between the arachnoid and pia mater membranes on the surface of the brain [1]. Two forms of aneurysms include saccular or berry aneurysms, which range in size from a few millimetres to 20 to 30 mm, and fusiform atherosclerotic aneurysms [2]. SAH can occur as a result of a head injury or spontaneously, often due to ruptured cerebral aneurysm, High blood pressure, smoking, family history, and cocaine use are the risk factors for spontaneous instances [3,4]. A CT scan of the head can usually confirm the diagnosis if it is performed within six hours of the onset of symptoms [5]. A lumbar puncture may be required on rare occasions. Every year, roughly one out of every 10,000 persons develops spontaneous SAH [6,7]. Females are more likely to be affected than males. While it grows more prevalent as people get older, around half of those who present with SAH under the age of 55. It is a type of stroke that accounts for around 5% of all strokes.

1.1 Incidence

About 40% of people die in the first episode of a hemorrhagic stroke caused by a burst aneurysm. As a result of the bleeding, 15% of patients die. Women have a higher rate of occurrence than men, and the rate climbs with age.

1.2 Causes

Trauma, cerebral aneurysm, cocaine abuse, sickle cell anaemia, anticoagulant therapy, problems with blood clotting [8].

1.3 Risk Factors

High blood pressure, smoking, alcohol consumption, race sex, age, genetics.

1.4 Clinical Finding

Thunderclap headache, or severe headache, vomiting, seizures, confusion, decreased level of consciousness, come, neck stiffness.

1.5 Diagnosis Evaluation

1. History collection
2. Physical examination
3. CT scan
4. Others: ECG, CBC, coagulation profile.
5. Lumbar puncture
 - A lumbar puncture, which involves removing cerebrospinal fluid (CSF) from the subarachnoid space of the spinal canal with a hypodermic needle, reveals evidence of bleeding in 3% of persons who have a non-contrast CT scan that is normal.
 - When imaging is delayed till after six hours from the beginning of symptoms and is negative, a lumbar puncture or CT scan with contrast is considered essential in persons with suspected SAH.
 - CSF is collected in at least three tubes.
 - A subarachnoid haemorrhage is indicated by an increase in the quantity of red blood cells in all bottles.
 - If the quantity of cells per bottle falls, it's more likely that a tiny blood vessel was damaged during the treatment (known as a "traumatic tap").
 - While no formal cutoff for red blood cells in the CSF exists, no recorded cases of less than "a few hundred cells" per high-powered field have been documented.

2. MEDICAL THERAPY

2.1 Pharmacology Therapy

1. Proton pump inhibitors
 - The most widely given class of drug for the treatment of heartburn and acid-related illnesses is proton pump inhibitors (PPIs).
 - They function by preventing acid from being produced in the stomach's parietal cell.
2. Antiemetics
 - These medications act by interfering with the neurotransmitter receptors in the brain that cause vomiting.

- The cells that receive the signals to send a nerve impulse are known as neurotransmitters.
 - These biological reactions are controlled by a complicated network of circuits.
 - The antiemetic medicine used will be determined by the cause.
3. Antiepileptics
- Antiepileptics are the drugs that reduce the frequency of epileptic seizures.
4. Calcium channel blockers
- The heart and the arteries contract more forcefully in the presence of calcium.
 - Calcium channel blockers stop calcium from reaching the cells of the heart and the arteries.
 - This causes the arteries to relax and widen there by lowering the blood pressure.
5. Stool softeners
- These drugs are intended to relieve constipation on a temporary basis.
 - Constipation can be exacerbated by certain drugs and circumstances.
 - Stool softeners, such as docusate, are frequently used as the first line of defence against and treatment for this form of constipation
6. Opioid analgesics
- Opioids are a class of medication used in the management and treatment of pain.

2.2 Nursing Management

- The nurse is in-charge of dispensing the medications and assessing their positive and detrimental effects on the patients. The pharmacologic therapy type and dosage is determined by the combination of these effects. Actions to assess clinical effectiveness in nursing include:
 - Observe for signs of difficulty with gait or coordination and monitor for changes in phenytoin blood levels with co administered drugs, monitor for dizziness and light-headedness
 - Perform active, passive and isotonic range of motion exercise as appropriate.
 - Check the bowel and bladder pattern of the patient

2.3 Nursing Diagnosis

- Acute discomfort associated with elevated intracranial pressure caused by stretching or compression of cerebral arteries and tissue.
- Fluid and electrolyte imbalance related to hyponatremia associated with nausea and vomiting.
- Imbalanced nutritional pattern less than body requirement related to low caloric intake and poor outcome associated with anorexia.
- Disturbed sleeping pattern related to haemorrhage
- Deficient knowledge about self care activities related to reportable signs and symptoms, treatment modalities and medications.

3. COLLABORATIVE PROBLEMS/ POTENTIAL COMPLICATIONS

- Rebleeding
- Hydrocephalus
- Intraventricular haemorrhage
- Seizures
- Cerebral vasospasm
- Intracerebral haemorrhage

3.1 Objective

1. To impart a general idea of the disease condition.
2. To explore knowledge regarding pharmacology, medical and nursing management.

3.2 Patient Information

- **Present history:** The female patient aged 65 years was admitted in the neurosurgery ward at AVBRH on 25/12/20 with the chief complaints of headache, vomiting and episodes of seizures since three days. The episodes of seizures occurred on 21/12/2020 and 24/12/2020. On admission she underwent all routine investigations like blood tests and CT scan. After a thorough examination, the final diagnosis was subarachnoid haemorrhage.
- **Past history:** Patient did not have history of communicable disease, asthma, tuberculosis, or hereditary disease. Patient was COVID – negative and did not have any significant surgical history.

Table 1. Blood Investigation Report

Investigation	results	Normal Range	Status
Complete blood count			
1. HB%	14.1%	13-15.5%	Normal
2. MCV	78.4cub.micron	80-90cub.micron	Normal
3. MCH	25 Pico gm.	26.5-33.5 Pico gm.	Decreased
4. Total RBC Count	5.64 million/cu.mm	4.5-6 million/cu.mm	Normal
5. Total WBC Count	14600 cu.mm	4000-11000 cu.mm	Increased
6. Total platelet count	4.43 lacs/cu.mm	1.5-4 lacs/cu.mm	Increased
7. Monocytes	04 %	4-10%	Normal
KFT			
1. Urea	52 mg%	18-40 mg%	Increased
2. Creatinine	1.1 mg%	0.7- 1.5 mg%	Normal
3. Sodium	127meq/l	136-145 meq/l	Decreased
LFT			
1. Total protein	6.6 gm.%	6-8 gm. %	Normal
2. Albumin	3.7 gm.%	3-5 gm.%	Normal
3. Total bilirubin	0.7 mg%	0.3 – 1 mg%	Normal
4. Bilirubin conjugated	0.2mg%	1-3 mg %	Decreased

3.3 Investigations

RTPCR- Negative

CT SCAN — Subarachnoid haemorrhage in the right frontoparieto temporal region and basal cisterns.

Subdural haemorrhage along falx and tentorium cerebelli

Diffuse periventricular white matter ischemic changes

3.4 Medical Management

Patient was medically managed in the ICU with Inj. Levipril 500mg, Inj. pan40-40mg, Cap.-nimodipine 60mg every four hourly, Inj.emset 4mg, Inj.Neomol 100ml, Syp. glycerol 30ml, Syp.- Zincovit 2tsp and Tab. Dolo 650mg.

Hospital Course: The patient was able to tolerate all the medications

3.5 Follow Up

A referral to the home care may be suggested for a hospitalized patient depending upon the physical condition of the patient and the availability of family assistance. The patients with subarachnoid haemorrhage have impaired physical stamina hence, often need home transfer assistance after hospitalization [9,10]. The home care nurse's assessment of the home's physical environment is important. Suggestions to adapt the home environment to meet limitation of the patient's activity are significant [11].

4. DISCUSSION

Subarachnoid haemorrhage is a form of hemorrhagic stroke in which bleeding occurs between the arachnoid and pia matter membranes on the surface of the brain, in the cerebrospinal fluid-filled space between them [12]. According to D J Hellawell et al. the three most common and persistent symptoms are tiredness, memory disturbance, and passivity that can be called the outcome of aneurysmal subarachnoid haemorrhage based on subjective symptoms and carers' perspective [13].

4.1 Strength

Patient was a 65 year old female who was able to tolerate all the medications given for a period of 1 month during hospitalisation with a satisfactory response.

5. CONCLUSION

Subarachnoid haemorrhage is a form of hemorrhagic stroke in which bleeding occurs between the arachnoid and pia matter membranes on the surface of the brain, in the cerebrospinal fluid-filled space between them. The prognosis is highly variable and dependent of severity of subarachnoid hemorrhage [14].

CONSENT

Before taking this case, the patient and her relative were well informed and the informed consent was obtained from both.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Simultaneous hemorrhage in intracranial aneurysms and in renal cyst in a case of polycystic kidney disease Agrawal A, Dwivedi S, Singh BR, Banode PJ - Saudi J Kidney Dis Transpl [Internet]. [cited 2021 Sep 30]. Available: <https://www.sjkd.org/article.asp?issn=1319-2442;year=2012;volume=23;issue=4;spage=794;epage=798;aulast=Agrawal>
2. Ak W, Dubey A, Chaturvedi S, Kumar S. Young COVID 19 presenting as fatal subarachnoid hemorrhage: Association or chance? Medical Science. 2020 Jul 14;24:2712–5.
3. Guidelines for Adult Stroke Rehabilitation and Recovery | Stroke [Internet]. [cited 2021 Sep 16]. Available: <https://www.ahajournals.org/doi/10.1161/STR.0000000000000098>
4. Subarachnoid Hemorrhage: Symptoms, Causes, Treatments [Internet]. [cited 2021 Sep 16]. Available: <https://my.clevelandclinic.org/health/diseases/17871-subarachnoid-hemorrhage-sah>
5. Stroke: Hope Through Research | National Institute of Neurological Disorders and Stroke [Internet]. [cited 2021 Sep 16]. Available: <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Hope-Through-Research/Stroke-Hope-Through-Research>
6. CT Scans for Children with Head Injuries | Choosing Wisely [Internet]. [Cited 2021 Sep 16]. Available: <https://www.choosingwisely.org/patient-resources/ct-scans-for-children-with-head-injuries/>
7. Marcolini E, Hine J. Approach to the Diagnosis and Management of Subarachnoid Hemorrhage. West J Emerg Med. 2019 Mar;20(2):203–11.
8. Subarachnoid hemorrhage (SAH) | Mayfield Brain & Spine, Cincinnati, Ohio [Internet]. [cited 2021 Sep 16]. Available: <https://mayfieldclinic.com/pe-sah.htm>
9. Hellowell DJ, Taylor R, Pentland B. Persisting symptoms and carers' views of outcome after subarachnoid haemorrhage. Clin Rehabil. 1999 Aug;13(4):333–40.
10. Subarachnoid Hemorrhage: Symptoms, Causes, and Risk Factors [Internet]. [cited 2021 Sep 16]. Available: <https://www.healthline.com/health/subarachnoid-hemorrhage>
11. Brain Basics: Preventing Stroke | National Institute of Neurological Disorders and Stroke [Internet]. [cited 2021 Sep 16]. Available: <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Preventing-Stroke>
12. Brain (Cerebral) Aneurysm: Symptoms, Causes, Treatment, Survival [Internet]. [cited 2021 Sep 16]. Available: <https://my.clevelandclinic.org/health/diseases/16800-brain-aneurysm>
13. Boehme AK, Esenwa C, Elkind MSV. Stroke Risk Factors, Genetics, and Prevention. Circ Res. 2017 Feb 3;120(3):472–95.
14. Kairys N, M Das J, Garg M. Acute Subarachnoid Hemorrhage. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 [cited 2021 Sep 16]. Available: <http://www.ncbi.nlm.nih.gov/books/NBK518975/>

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